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THE NEWCASTLE IMPROVEMENTS.—No. V.

[Grey Street from Dean Street, Newcastle-upon-Tyne.]

THE east side of Grey Street is composed, like the west, of sections, each of which exhibits a different design. The range of shops extending from Mosley Street to Shakspere Street has for its centre-piece a colonnade of lofty Corinthian columns, while the wings and projections are adorned with pilasters surmounted by balustrades.

The range from Shakspere Street to Market Street has the Theatre for its centre. By a good arrangement, the front of the Theatre is the only part visible from any street, the rest of the building running back between ranges of houses, so that the architect has avoided the blemish of a long extent of dead walls, while not a foot of the frontage on the neighbouring streets is wasted. There is a house and shop on each side the front of the Theatre, and ranges of shops enclose its sides. The ground being more valuable in Market Street than in Shakspere Street, it was Mr. Grainger's desire to erect more spacious shops and dwellings on the north side of the Theatre than on the south, and it became necessary to push the body of the Theatre out of the centre of the ground. This is done, and so ingeniously, that no visitor, architect or other, has ever discovered what might have been a serious blemish. The front, it is needless to say, is in the centre of the street design. After ascending the steps, the visitor enters the rotunda on one side, thus turning a little to the south to reach the great body of the building. The design of this Theatre was furnished by Mr. Benjamin Green of Newcastle, and is highly honourable to him. It is considered equal to any theatre in the kingdom in point of safety, convenience, and beauty; and is surpassed, as to extent, we believe, by few or none but Covent Garden and Drury Lane. The form of its interior is nearly the same as that of Drury Lane, the bulk of the audience being provided for, as in that theatre, in the centre of the house, by the flattening of the horse-shoe figure. The conveyance of sound is admirable. The corridors surrounding the boxes and pit are all fire-proof, being built of stone. The gallery staircase is constructed with such turns, guarded by strong partitions, as may best obviate danger from pressure, in case of an alarm of fire; and an additional flight of stairs is provided to be opened in case of accident. The building measures 170 feet backwards, and 57 feet in width.

There are other advantages, besides beauty of appearance, from this building being enclosed by others. It has greater stability than if its whole weight, and that of its contents, rested upon unsupported walls. There is both safety and convenience in the entrances being all from different streets. The entrance to the boxes is, of course, from Grey Street, through the portico and rotunda, the second tier being reached by a staircase from the rotunda. The entrance to the pit is by a wide passage from an archway in Market Street; and the gallery is reached from a similar archway in Shakspere Street. The quiet and order of the Theatre (it may be mentioned) are greatly promoted, and crowding prevented, by a floor 15 feet wide, and extending across the Theatre, being left open behind the gallery seats.

The Grey Street frontage, including in its design the house on each side, is 120 feet in length. The façade is divided into three masses; the centre one comprising a grand portico (after that of the Pantheon at Rome), of

six Corinthian columns, upon pedestals about six feet high, and surmounted by an enriched pediment, the tympanum of which is ornamented with the Royal Arms cut in stone by Mr. Tate of Newcastle. The breadth of the portico is 46 feet; and it projects over the broad flagged causeway of the street, forming a convenient covering for company alighting from carriages. The pedestals, columns, and pilasters in the front elevation are about 41 feet in height; and the whole is surmounted by a bold entablature, enriched with a modillion cornice, above which is a handsome balustrade, the angles being ornamented with vases carved in stone. The windows in the façade are arched and pedimented, so as to accord with the style of architecture. The front of the Theatre, with its bold projecting portico, is one of the most striking objects at the first glance up or down Grey Street, and the more it is dwelt upon, the more does it gratify the eye of the observer.

The foundations of this building were laid in July, 1836, and the whole, with the exception of the portico, was completed in six months. Mr. Grainger is able to express without restraint his admiration of this great ornament of his principal street, as the honour of its design belongs exclusively to Mr. Benjamin Green.

Still ascending Grey Street, we come to the range extending from Market Street to Hood Street. It is commonly thought that the town has foregone a great advantage by the Corporation having hesitated so long about agreeing to Mr. Grainger's proposals about the employment of this ground as to compel him to withdraw his offer.

Great inconvenience is experienced at the assizes from the town and county courts being in different parts of the town; and also from various circumstances in the construction of the old courts. The area which we are now speaking of appeared to Mr. Grainger the right spot for the erection of new courts, being high ground in a central situation, and in every way convenient of access. He proposed to erect here town and county courts in one building (though as separate properties), and to combine with them the various council-chambers and offices of the corporate body, town-clerk, &c., a residence for the judges, and for the public entertainments of the mayor. Mr. Grainger offered to take in exchange for these new erections the Moot-hall (present county courts), the old Guild-hall, and other property, according to the valuation of arbitrators. The magistrates of the county of Northumberland agreed to barter the present Moot-hall for their New Court, if the Town-Council of Newcastle would accede to the proposal as far as it regarded them. The Town-Council were indifferent or doubtful, and they hesitated so long as to compel Mr. Grainger to use his ground for other purposes. It is believed that this apathy on the part of the Council has saved the architect 10,000*l.*, but it has deprived him of the honour and satisfaction of conferring one great additional benefit on the town which is already incalculably indebted to him.

Parts of the design prepared for the proposed new courts have been preserved by Mr. Grainger in the range of buildings erected in their stead: 100 feet of the centre are occupied by the new District Joint-Stock Bank, which has private houses for wings. The basement front is supported by Doric pilasters. The centre above is recessed with arched windows, and the recess is adorned with Corinthian columns. Pilasters of the same order ornament the wings. The whole is surmounted by a balustrade, with urns in the intervals. The cornices of each story are adorned with richly-carved wreaths. The wings exhibit Doric pilasters and cornices like the centre. Mr. Grainger considers this the finest of the new erections.

Two more compartments finish the street. That between Hood Street and High-Friar Lane is of the Ionic order, with pilastered wings and recessed columns in the centre. From High-Friar Lane to Blackett Street is the plainest elevation of the whole series. It has a neat modillion cornice, differing from the rest, but no striking features.

In the centre of the north end of Grey Street, at its point of union with Grainger and Blackett streets, stands the Grey Column. It was erected by public subscription in honour of Earl Grey. The design was furnished by the Messrs. Green; and the statue of Earl Grey, by which it is surmounted, is by Bailey. The column not only forms a fine finish to this magnificent street, but is a striking object in approaching Newcastle in every direction. The great defect of the town as seen from a distance was, till lately, the absence of salient points for the eye to rest upon, a defect which the erection of this column goes far to remove. The statue was raised during the week of the meeting of the British Association, in August, 1838.

Thus much for Grey Street. The other streets, wholly the creation of Mr. Grainger, are:—

Grainger Street, 300 yards long and 66 feet wide. It is almost equal to Grey Street, two sections of it being the same designs continued.

Market Street, 190 yards long and 66 feet wide. Part of the elevations here also are the same designs continued.

Clayton Street, 516 yards long; and Clayton Street West, 220 yards long by 62 feet wide. These two streets consist of large private houses.

Nun Street, and Nelson Street, each 104 yards in length.

Wood Street, 78 yards by 50 feet.

Shakspere Street, 80 yards by 50 feet.

These streets all show fronts of polished stone in varied designs; and thus are nine new streets, of rare beauty, added to the town in the course of five years.

[To be continued.]

THE FLUTE.

The musical instrument to which we now apply the name of *flute* differs considerably from that known in past ages by the same name. Many of our translators of classical writers apply the word *flute* to the pipes which are so frequently alluded to in connection with the sylvan scenes of Greece; but many of those pipes appear to have borne a nearer resemblance to a modern flageolet than to a flute.

The history of the flute seems to consist of five different stages, the first ascending to the remotest antiquity. Most persons are aware that a small open tube, if blown into forcibly, will yield something approaching to a musical sound; and that if the tube be closed at one end —as in the instance of the barrel of a small key—a piercingly clear note may be produced by blowing obliquely into the tube. Now, it is probable that a simple tube, such as either of these, gave the first idea of a musical wind-instrument. But for the production of anything like melody one such tube was obviously insufficient, whether it were made of the shell of a fish, of the horn of a quadruped, of an oaten straw, or of a hollow reed, all of which appear to have been employed. It was therefore a notable advance when the suggestion was made to arrange several such tubes side by side, some larger than others. Who was the real inventor of this compound instrument is now perhaps impossible to be determined, but it has obtained the name of *pan-pipes;* and mythology ascribes it to Pan, who had a set of seven tubes of unequal length, connected together by means of wax, and who fixed on the number of seven, because of its relation to the number of the (then) known heavenly bodies. Without, however, dipping more deeply into the regions of mythology, we may deem it pretty certain that such a compound instrument as this has been known from the times of the Greeks to the present day; for there is no doubt that the modern *mouth-organ*, or *syrinx*,

is the same instrument in principle as the *pan-pipes* of the Greeks. The principle of this instrument may be soon understood. If we take two barrelled keys of different sizes, and blow into them one after the other, we shall find that the larger of the two will yield the lowest or gravest tone; and moreover, if we plug up a portion of the length of either pipe, the tone yielded will be higher than it was before. If we wish to have eight pipes which will yield the eight common tones forming an octave, we might select eight hollow reeds of different diameters and lengths, and plug up the lower end of each. If the sounds were not found to be in the desired proportion one to another, the plugs of some might be thrust a greater or a less distance into the tube, and thus the required effect might be produced; for the diameter of a pipe remaining the same, the sound yielded is more and more acute as the pipe is shortened. We are not here describing the method actually adopted by the ancients, for it is not well known how far they were acquainted with the musical intervals forming collectively what we call an octave; but we are merely explaining the fundamental principles of such an instrument.

The syrinx may be deemed the second stage in the history of the flute; and it was succeeded by another of great importance. Any one musical instrument, in order to produce melody, must be capable of yielding different tones; these tones were, as we have seen, produced in the syrinx by several pipes of different sizes; but in the change which we shall call the third stage, these several tones were produced from one pipe. It would be as useless to endeavour to discover the inventor of this improved pipe as the inventor of the syrinx: we may merely say that the shepherd's pipe, in some form or other, was known both to the Greeks and Romans. The circumstance which renders a pipe or tube capable of yielding different tones is by perforating it with holes in different parts of its length, which holes can either be covered by the fingers or left open. We have stated that when a tube is shortened, the tone yielded by it is higher in pitch. A perforation in the side of the tube is nearly equivalent to shortening it, because it allows the air to escape at a shorter distance than before from the mouth-hole; but if the perforation be stopped by the end of the finger, the instrument becomes as if it were unperforated. Pursue it farther, and suppose two perforations to be made: these would give to the tube three different effective lengths, according as one or both were open, or both closed. A farther increase in the number of perforations increases still more the power of varying the tones produced. As to the precise value of the differences between the tones, that would depend on the distances of the perforations one from another.

The third stage in the history of the flute is—a hollow tube, blown into at one end; and having several perforations in different parts of its length, which perforations are of a size to be easily covered by the finger. That such an instrument was extensively known among the ancients, there is abundant proof, derived from sculptures, pictures, coins, mosaics, and written descriptions. There were flutes of various denominations—curved, straight, small, middle-sized, single, double, right, left, equal, unequal, &c.; but it must be owned that the precise meaning of some of these terms is not now easy to determine; for instance, all we know about "right-hand equal flutes" is, that this is the interpretation given to the expression, *tibiis paribus dextris*, used by Terence; and that when he speaks of a player producing music *tibiis imparibus*, this is interpreted to mean "with unequal flutes." We may, however, state that double flutes were evidently often used, and it is probable that one of them was destined to yield lower tones than the others: this is rendered more probable by the circumstance, that some of these double flutes had no finger-holes, so that it was desirable to produce different tones from the two flutes. Some have supposed that the higher toned flute of the two was used to accompany gay and playful dramas; while the lower toned was appropriated to grave and serious pieces. Others again have supposed that the lower toned flute was used as a kind of drone, or continued bass, while the other performed an air. Be this as it may, there are many representations of ancient flute-players, in which the man holds a flute in each hand, and has a bandage fastened across his mouth, with a narrow slit in it; the object of this bandage may have been either to prevent the breath from passing out at the corners of the mouth, or to protect the cheeks from the bursting effects of blowing into a difficult instrument.

Dr. Burney endeavoured in vain to discover in what manner the sounds of these instruments were elicited. They were blown into at one end, like a clarionet; but whether they had a reed is doubtful: all clarionets, as well as some other instruments, have a little vibrating tongue, called a reed, near the mouth orifice; and the vibration of this reed gives the peculiar character to the sound of the instrument. Dr. Burney could never find any allusion to a reed of this kind; but he found reason to believe that a flute-player sometimes fixed a little tube to the end of his flute, in such a manner, that by drawing it out or thrusting it in, the pitch of the flute was changed—a contrivance very similar in principle to that adopted by the modern flute-player.

The use of pipes or flutes was by no means confined to the Greeks and Romans. There are many representations of such instruments among the rude drawings of the ancient Egyptians; and the modern Egyptian instrument, called the *Náy*, is probably a descendant, with some modifications, of the ancient Egyptian flute. Of this instrument Mr. Lane thus speaks:—"The *Náy*, which is the fourth and last of the instruments which I have mentioned as most commonly used at private concerts, is a kind of flute. There are several kinds of náy, differing from each other in dimensions, but in little else. The most common is that here represented. It has been called the durweéshe's flute, because often used at the *zikrs* of durweéshes to accompany the songs of the *moonshids*. It is a simple reed, about eighteen inches in length, seven-eighths of an inch in diameter at the upper extremity, and three-quarters of an inch at the lower. It is pierced with six holes in front, and generally with another hole at the back. The sounds are produced by blowing through a very small aperture of the lips against the edge of the orifice of the tube, and directing the wind chiefly within the tube. By blowing with more or less force, sounds are produced an octave higher or lower. In the hands of a good performer the náy yields fine mellow tones; but it requires much practice to sound it well. A náy is sometimes made of a portion of a gun-barrel."* This instrument is neither held like a clarionet nor like a modern flute, but in an inclined direction, sometimes towards the right and at others towards the left.

The instrument known in England by the name of flute in the beginning of the last century resembled more or less those of which we have been speaking. It was called the English flute, or flute *à bec*, from the upper end, or mouth-piece, being curved somewhat like the beak of a bird; and it was used in concerts to perform the same parts afterwards taken by violins. Sonatas for two flutes and a bass, and solos, duets, and concertos for the flute, were very common; but when the works of Corelli and other composers brought the violin more into vogue, the flute *à bec* gradually got into disuse. It was an imperfect instrument, and all the skill of the makers seems to have failed in removing the imperfections.

It is remarkable that nothing is known as to where or

* 'Modern Egyptians,' vol. ii., p. 71.

when the modern flute, called the German flute, was invented. It must be borne in mind, that all the instruments which have hitherto engaged our attention were blown into at one end; but the German flute is held nearly horizontal,—one end is plugged up,—and the mouth-hole, or embouchure, is in the side of the instrument, a few inches from the plugged end. There seems to be an impression, derived probably from the name, that it was first known or appreciated in Germany, though we know not by whom. M. Berbigueur, the eminent French flute composer, has advocated the following hypothesis respecting the origin of the flute *traversière*, or German flute. It is stated that in some of the monuments or inscriptions of ancient Egypt there are indications of the use of traverse flutes, or flutes crossing from right to left. There is also an hypothesis that a colony of Egyptians established themselves on the confines of Hungary and Bohemia, and became known by the names of Gypsies, Zingari, and Bohemians. The inference drawn from these premisses is, that the ancient Egyptians were acquainted with an instrument similar to the flute *traversière*, or modern German flute,—that the use of it was carried to Bohemia by a wandering band of colonists,—and that their neighbours the Germans, being a musical people, borrowed the idea from them, and gradually presented to other European nations an improved instrument which has obtained the name of the German flute. Without offering an opinion on this train of suppositions, we may remark, that if a person glance at Mr. Lane's representation of the manner of holding the Egyptian *náy*, and if he then consider the very oblique position in which some players hold the modern flute, it would require no great stretch of the imagination to deem one instrument to be similar to the other, although in effect one is plugged up at the end and the other is open.

Whatever be the origin of the German flute, we may consider it, in its most simple form, as the fourth stage in the history of the instrument; and that the gradual improvements which have been made in it (chiefly, we believe, by English makers) during the last fifty years, have brought it to a state of excellence which may be considered as its fifth or final stage; for it is doubtful whether its powers will ever be greatly extended beyond their present degree. Without detailing the purpose of all the improvements that have been made, we will give a general description of an eight-keyed German flute.

The best flutes are made of box, ebony, cocoa, ivory, or crystal: the two latter are objects rather of show than of use, for, independent of their high cost, it is found that the quality of the tone is not such as to make them desirable instruments. Box is less used than formerly, ebony being superior to it, and cocoa being the most sonorous and brilliant of all. The flute consists generally of four pieces, joining one to another, end to end, in a tolerably air-tight manner. The upper end is plugged up by a cork to which a screw is attached, and if the instrument be delicately made, the tone is affected by changing the position of this cork. The upper joint contains one perforation for the mouth-hole, the second contains three for the fingers of the left hand, and the third also three for those of the right hand.

The finger-holes are placed at such relative distances, that by closing one or more of them, all the major tones and some of the semitones may be produced, with an approximation towards correctness. But in order to produce the remaining semitones, and to render the others more nearly perfect, keys are employed. These keys may be regarded in the light of so many additional perforations; for beneath each key there is a hole, and the key is merely to keep that hole shut except for the production of certain notes. In an eight-keyed flute, therefore, there are not only six perforations, to be stopped by the fingers, but also eight others, stopped by keys; and as all these fourteen may be open at once, or closed at once, or any number of the fourteen open and the rest closed, it is obvious how much increase of power the player has to vary the number of changes in the position of the open holes. Generally speaking, an eight-keyed flute has two of the key-holes open, except when the keys are pressed down,—a contrary arrangement to that adopted in the other keys: these two keys are to enable the player to produce two notes (c♮ and c♯) lower than he could otherwise produce on the flute. Of the remaining six keys, five are to produce the D♯, F♮, G♯, A♯, and C♮ more correctly than they could otherwise be produced; and the remaining one is useful in certain rapid passages. Flutes have been made with as many as eleven keys, in order to produce two additional semitones, and to increase the facility of playing some particular passages: but it is doubtful whether the increased effect is adequate to the increased complication of the instrument.

Should a flute player be playing in concert, and his instrument be a little sharper or flatter than the others, it would be desirable to have the means of changing the pitch of the flute. This is, to a certain extent, effected by having an air-tight sliding tube in the upper joint: by drawing this out, the effective length of the instrument is increased, and, as we before stated, the pitch thereby lowered. But this adjustment, if exceeding a small amount, throws the whole instrument out of time; for the distances between the finger-holes ought to be increased in the same ratio as the whole length of the flute: this has never yet been done, by any mechanical ingenuity, although an approach has been made towards it by some makers.

The embouchure and finger-holes of the modern flutes made in England and Germany are larger than those of the French flutes; the effect of which is this,—that although the latter are easier to play, the former, when well played, emit a greater volume of sound. This admission is candidly made by M. Berbigueur, who is well qualified to judge, and who says that a French flute has the *thin* quality of tone of a flageolet, when compared with a modern English flute.

The generality of flutes are made and tuned to concert pitch, that is, the c of the flute agrees with the c of the orchestra, but there are smaller flutes whose pitch is higher; especially one called the octave flute, whose notes are one octave more acute than those of the large flutes. The smaller kinds of flutes are not so liberally supplied with keys as the larger, so that their intonation is not so correct.

[Egyptian playing on the Náy.]

HORSE ARMOURY IN THE TOWER.—VI. Henry VIII.

[Henry VIII.]

We have now arrived at a period when the artificers of Italy and Germany had brought the armour to a degree of splendour, before which the results of preceding efforts appear to dwindle into insignificance. As a specimen of the workmanship of the early part of the sixteenth century, it would be impossible to find anything of more value than the armour now in the Tower made for Henry VIII., and presented to him by the emperor Maximilian, and which is represented above.

It is not only the finest specimen of the armour of the period now extant, but was doubtless considered one of the chefs-d'œuvre of the German artists, at the time it was made. It is to Sir Samuel Rush Meyrick that we are indebted for the knowledge of the fact, that this splendid suit belonged to the monarch under whose name it is now placed in the gallery, as well as for the discovery of the corresponding horse-armour. In the letter which Sir S. Meyrick addressed to the Society of Antiquaries on this interesting occasion, and which letter bears the date of March, 1827, he says:—"In the new arrangement of the horse-armoury at the Tower, which the Master-General and the Honourable Board of Ordnance were pleased to confide to my direction, I deemed it proper that several of the horses should be barbed, instead of allowing the armour for that purpose to remain indiscriminately mixed with the pieces on the walls. Having therefore ordered all of such description to be brought to me, that I might put together those of a suit, I found some covered with black paint, which, on holding to the light, appeared to me to contain a faint resemblance to engraving. On removing a portion of this coating, my conjectures were not only confirmed, but I instantly saw that these were the horse-armour for the suit hitherto considered as having been made for Henry VII., and which has the characteristic contour of the close of his reign.

"On the whole being sent to Enfield to be cleaned, I requested Mr. Lovell, the superintendent of the Small Armoury department there, whom I knew to be very skilful, to take accurate tracings of whatever was worthy of remark. The result has proved the suit to have belonged to Henry VIII., and exhibits a curious picture of the superstitious feelings of the times, which conceived a man's body to be doubly protected when not only sheathed in steel, but covered with the legends of saints."

This armour is washed with silver, and consists of a globular breast-plate, puckered lamboys of steel in lieu of taces and tassettes, square-toed collerets, a bourginot with a mentonnière to act as a gorget, and pass-guards on the pauldrons. The horse-armour is composed of a chanfron, manefaire, poitral, flanchards, and croupière; but the original saddle is wanting.

Surrounding the lower part of the horse-armour is the motto "Dieu et mon droyt;" and on the base of the lamboys, repeated all round, are the letters H. K., an inch and a half in height, of gilt brass, placed between two brass beads on the steel. On the breast-plate is engraved a figure of St. George, the patron saint of England, represented as having just "swinged the dragon;" and on the back-plate is a figure of St. Barbara. On one of the 'Jambes' is the German word of congratulation "Gluck," *i.e.* Good Luck! from which it has been conjectured that it was on the occasion of the marriage of Henry to Katherine of Aragon that the armour was presented to him by the emperor Maximilian. St. George is again represented on the front of the poitral (in the horse-armour), and various actions of his life on other portions of the same armour. On the croupière, the martyrdoms of St. Agatha and other saints are represented.

The badges of Henry VIII. and Katherine are engraved on many parts of the horse-armour, and on the fans of the genouillières of the king is the sheaf of arrows, the device adopted by Ferdinand, the father of Katherine, on his conquest of Granada, when he also assumed the pomegranate—a device which frequently occurs in this suit.

Besides the above subjects, the armour is profusely

decorated with arabesque and grotesque ornaments, such as basilisks, dragons, cupids, animals, &c.

The whole of the armour is in good condition, and precisely resembles that in which the king is depicted on his great seal, which bears a great similarity to the emperor Maximilian's own armour preserved in the palace of the Little Belvidere at Vienna.

The perfect and uniform appearance of this suit is such, that it only requires to be placed on figures having a greater resemblance to natural objects, to realise to the spectator the actual presence of the monarch as he appeared in one of those stately pageants, to which he was so partial, when rank and valour did their devoirs before the throne of beauty, and the king himself forgot, in the general obedience paid to the wishes of the ladies, the homage that was due to himself.

Unfortunately, however, the figures on which the armour of this collection is placed, are scarcely better than tailor's blocks, and the horses are, if it be possible, still more wretchedly executed. Formerly, we believe, there were several figures of horses in the Tower carved in wood by or under the direction of the celebrated Grinlin Gibbon; we know not what has caused their removal, but we cannot think it could have been to make room for those which now fill the gallery. Who would recognise in the uncouth objects before him a representation of the noble war-horse animated with the fire that lightens up his master's countenance, and pawing the ground impatient for the fray? We might certainly look upon them and exclaim with the poet—

> "How firm the manag'd war-horse keeps his ground,
> Nor breaks his order, though the trumpets sound!
> With fearless eye the glittering host surveys,
> And glares directly at the helmets' blaze!"

But however well this picture of the docility of the horse is represented in these figures, there is nothing about them to lead us to imagine the animal capable of the action and vivacity for which he has been celebrated by so many writers.

Leaving, however, this subject, we must continue our account of the progress of arms and armour.

The principal feature in the armour of the time of Henry VIII. is the lamboys, which, introduced in the reign of his father, formed a distinguishing part of this and the following reign. These were generally appended to the breast-plate, but, when this was not the case, tassets and cuisses, composed of several plates instead of one, were worn upon the thigh. The lamboys greatly increased in dimensions shortly after its introduction, and in this reign, as will be seen from the engraving, had attained a complete resemblance to a full petticoat. In addition to the embellishments hitherto employed, a kind of armour called 'raised armour' was now introduced, the ground being kept black, whilst the pattern, raised about the tenth of an inch, was polished.

Puffed and ribbed armour, in imitation of the slashed dresses of the day, was also occasionally worn, some very fine specimens of which are still preserved at Goodrich Court in the Meyrick collection.

The tilting helmets were but seldom used, a head-piece called a coursing-hat, with a mentonnière, being worn instead; from this a plume of feathers hung down behind, sometimes to a great length, as represented in the seal of Henry VIII., where it is depicted as very long and full.

The varieties of weapons introduced are but few; and these unimportant, if we except the pike, which, having been introduced into France by the Swiss in the time of Louis XI., soon made its way over Europe. From this time to the reign of William III., pikemen composed a principal part of the infantry of the English army.

The pertuisane, or partisan, a variety of the pike or spontoon, must also be enumerated as one of the new weapons of the time of Henry VIII., as well as the pistol, the dag, or tacke (a different sort of pistol), and the application of the wheel-lock to hand-guns.

EXTERNAL STIMULANTS.

It seems probable that even the earliest practice of physic was not purely tentative, but was founded on the observation of nature's methods of relieving disease. In no instance is this more likely to have been the case than in the use of external stimulants. A man, for example, was subject to constant headaches, which ceased on the appearance of an eruption on the back of his neck; the eruption disappeared, and the headache returned; what could be more natural than to attempt to supply its place by some stimulating application? Instances of the relief afforded to severe internal disease by a slight external ailment are not uncommon; and there are cases where the removal of the latter has led to the fatal termination of the former. Several of these are mentioned by Dr. Granville, in his work on 'Counter-Irritation.' In one instance, a young lady had a purulent discharge behind the ears, which a surgeon cured with an ointment containing corrosive sublimate. A few weeks afterwards she was taken ill on the Continent, after moderate dancing, and died of an affection of the heart in forty-eight hours. On examination it was found that the right ventricle of the heart contained an earthy calculus.

The death of Louis XVIII. followed close upon the healing of most of the old sores in his legs.

A gentleman who is subject to large boils every spring and autumn, is wretchedly low and miserable while they are painful; but when suppuration is fully established, his health and spirits improve, and in six weeks he becomes a new man in feelings and appearance. On one occasion, however, he stopped the progress of the boils with leeches and preparations of lead; in consequence of which both his life and intellect were in danger.

In a fourth case, a gentleman had an obstinate scaly eruption (*psoriasis*) on the palm and back of his right hand. Attempts were made to cure it, but in vain. The patient consulted Dr. Granville, whose opinion was that all attempts to check the eruption suddenly should be given up, and might be fatal. This advice, however, was disregarded; and many years afterwards Dr. Granville saw the gentleman with his hand quite smooth—the effect of some empirical pomatum. "He was then labouring under every symptom of unmitigated dyspepsia, accompanied by a dull heavy incessant pain in the right side. He died almost unexpectedly a twelvemonth after, aged forty-four years; and on examination, a large tumour, containing purulent matter, was found, placed between the liver and duodenum, and connected with both."

Again, when children are affected with some copious eruption, and this is checked too suddenly, water in the head or inflammation of the membranes of the brain is apt to follow, and a trivial disease is exchanged for one of frightful severity. "On the other hand," says Dr. Granville, "children affected with either of the two latter very serious complaints were often brought under my notice, who suddenly got well on the spontaneous appearance of the before-mentioned eruption, or upon the back of the ears becoming suddenly and extensively sore."

In all these instances the advantage of the counter-irritation caused by nature is obvious: whether we suppose the benefit to result merely from the morbid process in the skin supplying the place of a similar action in more important organs; or whether we believe, with the partisans of the humoral pathology, that some noxious matter is actually eliminated from the blood, in the boil, ulcer, or eruption. The humoral pathology, we may observe, after having reigned in the schools from the very commencement of the history of physic, suffered a temporary eclipse of forty or fifty years; but for some

years past it has strongly tinctured medical doctrines, and bids fair to regain it former ascendency. Among the public it has never lost its influence, and the theory that an eruption is a "humour" appearing on the skin, has always been the popular one. The humoral pathology certainly solves a thousand riddles, and one is inclined to favour it almost instinctively. The delicious feeling of ease experienced after the suppuration of a crop of boils, does not arise merely from the removal of the irritation caused by their presence, for it is infinitely superior to the state of the patient before the first appearance of the boils. How natural then to conclude that the agreeable change has been chiefly produced by the expulsion of some noxious matter!

However this may be, it is certain that the imitation of nature by the use of external stimulants has formed a part of the practice of physic from the earliest times. One of the most obvious of these remedies is the actual cautery, or red-hot iron. This was apparently an habitual application with Hippocrates, who says, "What medicine does not cure, steel cures; what steel does not cure, fire cures; but what fire does not cure, is incurable." This practice was common as late as the last century; for we read that in Pott's early days the irons were regularly heated for the round of the surgeons at St. Bartholomew's Hospital. But with the progress of time, surgery, like law, has become more lenient; and in this country at least the actual cautery is rarely employed. When skilfully applied, it is not so severe as might be imagined; it instantaneously destroys the life and sensibility of the parts to which it is applied; and the true skin (as well as the cuticle) being killed, the pain after its employment is not very great. The neighbouring skin is protected by wet linen or plaster, and the patient is thus spared the pain which would result from its half-destruction. Still, however, there is something revolting in the remedy, and it is fortunately but seldom if ever necessary.

Scalding water is another method of applying heat as a counter-irritant; it was sometimes adopted at Paris in cases of cholera.

Moxa, says Sir William Temple, is an Indian moss used in the cure of the gout by burning it on the part aggrieved. According to Mr. Davis, in his 'History of China,' the Chinese prepare their moxa by bruising the stems of an artemisia, called *gae-tsaou*, in a mortar, and then selecting the most downy fibres. The moxa is also used in rheumatism, and perhaps in tic douloureux; but it is rarely employed in this country.

Blisters are probably more used than all other methods of counter-irritation put together, and therefore deserve a more detailed account. One of the names by which the blister-fly is known in scientific zoology is *Cantharis vesicatoria*; and Hippocrates employed an insect for blistering, which he calls κανθαρις (*cantharis*). Still it is not certain that he used the same fly, though it was one of a kindred quality; and from the description of the blister-fly given by Dioscorides and Pliny, it is clear that their cantharides were not identical with ours.*

The blister-fly is often called the Spanish fly, as it was formerly imported from Spain. It is found in France, Germany, Hungary, Russia, and other parts of Europe; and is imported from St. Petersburg, and also from Messina in Sicily.

The blister-fly "has an elongated or almost cylindrical shape; its length is from six to ten lines (rarely longer); its thickness one or two lines: it has a golden green colour, and a nauseous unpleasant odour. The body is covered with whitish grey hairs, which are more numerous on the thorax than on the head, abdomen, or legs."†

* Pereira, in 'Medical Gazette,' vol. xvii., p. 593.
† Pereira, in 'Medical Gazette,' vol. xvii., p 594.

These insects are not applied to the body in substance, but always after having been mixed with other materials. The following, for instance, is the formula for the blistering-plaster of the London College of Physicians:—"Take of cantharides, rubbed to a very fine powder, a pound; wax plaster, a pound and a half; prepared lard, a pound. Sprinkle the cantharides in the plaster and the lard, melted together and removed from the fire, when just about to become solid, and mix the whole together."

This is usually spread upon leather, leaving a margin covered with adhesive plaster, to make it stick to the skin.

The Edinburgh Pharmacopœia directs the blistering-plaster to be made with equal parts of cantharides, resin, bees'-wax, and suet. It also contains a compound blistering-plaster, made of Venice turpentine, Burgundy pitch, cantharides, bees'-wax, verdigris, white mustard-seed, and black pepper. This is more stimulating than the common plaster, and is intended to raise a blister more quickly; "thence it is adapted for cases of gout and cramps of the stomach, in which the effect of the blister must be almost instantly produced. Its operation is accompanied with great pain, and a pungent sense of heat: it is apt to cause very unpleasant ulceration if allowed to remain too long applied."*

The French Codex has two blistering-plasters. The first is made with four ounces of each of the following articles:—resin, lard, bees'-wax, and cantharides; with the remark, that in summer there is to be an ounce less of lard, and an ounce more of wax. The second plaster is called the *emplâtre vésicatoire Anglais*, and is composed of equal parts of wax plaster, lard, and powdered cantharides; so that it differs from the London formula only in the proportion of its ingredients, and there but slightly.

But enough of the method of preparing blisters; let us now bestow a few words on their practical application. Blisters are used in large classes of disease; in inflammatory ailments, in nervous ones, and in those frequent distempers which seem to hold a middle place between the two, and may be termed diseases of irritation. Their visible effect is to raise the cuticle (or scarf-skin) from the cutis (or true skin), and cause serum to be poured out between them; their secondary effect is very commonly to mitigate the inflammation or pain for which they were prescribed. In some irritable habits blisters destroy the true skin, and thus cause a very unpleasant ulceration. After a blistering-plaster has remained on the skin six, eight, or ten hours, it is removed; the blister is cut, in order to let out the serum, and the place is dressed with spermaceti ointment. Sometimes it is thought desirable to keep up the stimulus, and the spot is dressed with savine ointment; but the continued irritation is apt to make an ugly sore, and it is better practice to allow the place to heal, and then apply another blister.

The principal precautions to be observed in the application of blisters are—

1st. That the blister is not to be too large; for a skin-deep wound of great size destroys life like a stab in a vital organ. This error rarely occurs in regular practice; but the loss of life caused by the skin-deep wounds of a late empiric renders this hint necessary.

2ndly. A blister is not to be applied during the acute stage of inflammatory disorders, or while much fever is present; though it may do good service when the force of the inflammation has been lessened by bleeding and other measures.

3rdly. Blisters are not to be used in persons of a dropsical habit; nor in very irritable patients, unless under urgent circumstances, and then only of small size, lest they should cause too much fever.

* 'The London Dispensatory, by Dr. A. T. Thomson, 9th edit., p. 866.

4thly. For the reason just given, blisters are not to be rashly applied to infants or young children. In the few cases where they may be thought absolutely necessary, they must be left on for a short time only, as from two to four hours; or the blister-plaster of the Pharmacopœia may be diluted with a proper quantity of soap cerate.

Mere slips of blistering-plaster put behind the ears of young children are employed with advantage to relieve the head or eyes; and are also useful in adults.

Before dismissing the subject of blisters, we may mention that, in 1810, Robiquet discovered that an active principle, to which Professor Thomson of Glasgow gave the name of *cantharidin*, could be separated from the blistering-fly. Many of our readers are aware that this is one of a series of similar discoveries which have been made within the last thirty or forty years. Thus the narcotic part of opium, the emetic principle of ipecacuanha, and so on, can be obtained in a separate form.

A grain of *cantharidin* dissolved in alcohol, and mixed with one ounce of lard, is said to make a very active ointment.

There is a blistering-liquid made by soaking cantharides in acetic acid. It is intended for raising blisters suddenly.

Tartar Emetic Ointment.—This is an excellent counter-irritant, and is much used in modern practice. The common strength is, or was, a drachm of the tartar emetic to an ounce of lard or spermaceti ointment. In the late editions of the London and Edinburgh Pharmacopœias, the strength is 1 to 4, instead of 1 to 8.

Dr. Jenner, in his treatise 'On the Influence of Artificial Eruptions' (London, 1822), says, that the general strength should be a drachm of the tartar emetic to an ounce of simple cerate; but he remarks that in some cases it is necessary to make it stronger, when he prescribes the following compound: two drachms of tartar emetic, nine drachms of spermaceti ointment, a drachm of white sugar, and five grains of the red sulphuret of mercury. He says that sugar prevents the ointment from becoming rancid.

"A patient applied the ointment according to the preceding formula, at night, and had eruptions next morning, which was within a space of twelve hours. He had, however, used the same on a preceding occasion in cold weather, and with a skin less perspirable; in this instance it was much tardier in vesicating." (Jenner, p. 54.)

We surmise that Jenner put "vesicating" by a slip of the pen; the effect of the common tartar emetic ointment is to produce not vesication, but an eruption much resembling small-pox; and though the effect might be slightly altered by the red sulphuret of mercury, we do not think the compound ointment would blister.

The common method of using the tartar emetic ointment is to rub a bit as big as a hazel-nut or larger on the part affected, night and morning, until pustules appear. The part is then washed, and the application discontinued, lest ulceration should ensue. Four or five rubbings will commonly suffice, or fewer, if the ointment is strong, or the skin very irritable. The preceding extract from Jenner afforded an example of this; here is another from the same work:—

"In the case of a lady, where two parts of the tartar emetic and one of simple cerate were used, eruptions appeared in a few hours." (p. 54.)

Potash.—This alkali in its caustic state is much used as a counter-irritant, particularly in diseases of the spine and hip-joint. Caustic potash is procured by evaporating the solution of potash, and when it melts, pouring it into proper moulds. The sticks of caustic thus made are kept in well-stopped bottles, as they deliquesce (or melt down) by the contact of air. When applied to the skin, caustic potash corrodes it, and forms a soapy compound with it. Caustic potash is a curious example of the changes which have continually occurred in chemical and pharmaceutical nomenclature. Thus it has been called *Kali purum*, *Lapis causticus*, *Potassa fusa*, and *Causticum commune acerrimum*. Another of its names, *Cauterium potentiale*, or potential cautery, was given it by way of opposition to the *Cauterium actuale*, or actual cautery. In the London Pharmacopœia it is now called *Potassæ Hydras* (or hydrate of potash), and in the Edinburgh Pharmacopœia simply *Potassa*.

To be continued.]

Lending Books.—Those who have collected books, and whose good-nature has prompted them to accommodate their friends with them, will feel the sting of the answer which a man of wit made to one who lamented the difficulty which he found in persuading his friends to return the volumes which he had lent them. "Sir," said he, "your acquaintances find, I suppose, that it is much more easy to retain the books themselves than what is contained in them."—*Andrews' Anecdotes.*

Arab Mode of tracing Footsteps.—The Arab who has applied himself diligently to this study, for it is only to be acquired by long practice, can generally ascertain, from inspecting the impression—1, whether the footsteps belong to his own or to some neighbouring tribe, and consequently whether friend or foe has passed; 2, he knows, from the slightness or depth of the impression, whether the man who made it carried a load or not; 3, from the strength or faintness of the trace, whether he passed on the same day or one or two days before; and 4, from a certain regularity of intervals between the steps, a Bedouin judges whether the man is fatigued or not, and hence he can calculate the chance of overtaking him. This faculty of distinguishing footsteps on the ground extends to beasts (horses and camels) as well as men, and, in the exercise of it, the same observations will lead to the same results.—*Robinson's Travels in Palestine and Syria.*

Effect of Employment on the Insane.—The occupation of the patients has always formed a leading feature in the regulation of the Hanwell Asylum, and has given it a celebrity throughout Europe. The bazaar, the gardens and farm, the laundry, the bakehouse, the brewhouse, the kitchen, the shops of the smith and carpenter, the shoemaker and tailor, are thus converted into so many convalescent wards. In whatever part of the establishment work of any kind is going on, some patients are in some way or other furnished with a little occupation; and this employment tends in many cases to advance the recovery of those who are beginning to improve, and affords opportunities for little tests of self-control and temper which are valuable preparatives for being returned to society. There are also several incurable patients, whom daily but not severe occupation relieves from most of the misery attendant on their mental condition. Many insane persons who wish to be employed, and to whom employment is extremely useful, are incapable of regular application to any employment whatever. Their work, at the best, is desultory, and often imperfect, and for severe labour their malady and their diet equally disqualify them; but the value of occupation, even of the lightest kind, to themselves, can scarcely be over-stated. As much care as possible is taken that those who cannot be induced to join in any kind of work should be as long as possible prevented from sinking into total inactivity. Notwithstanding every attention, there are some in whom this progress to inertness and torpor cannot be prevented. Examples may be seen in this, as in all asylums, of patients who will sit motionless from morning to night; doing nothing for days, weeks, or months, but when urged to action; seldom or never speaking; sometimes requiring to be fed like children; but the functions of their limited degree of life continuing, although feebly, and so as to make its extinction at all times a probable event.—*Report of Doctor Conolly, Resident Physician at the Hanwell Lunatic Asylum.*

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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